

Green Slime!

By Lt. Al Lumanog,
NEPMU-5

It started with a phone call from a ship's doctor, asking me to come aboard and check a mysterious substance that was leaking from electrical cables in the IC room.

A week earlier, while the ship had been underway, the 1MC had broken down. As the IC troubleshooters rushed to fix the system, they noticed an oily, green, gel-like substance leaking from the cables of the amplifier oscillator. One of the ICs wiped off the substance with a rag. By the time the shop supervisor realized the material could be polychlorinated biphenyls, or PCBs, five other people had touched the green gel.

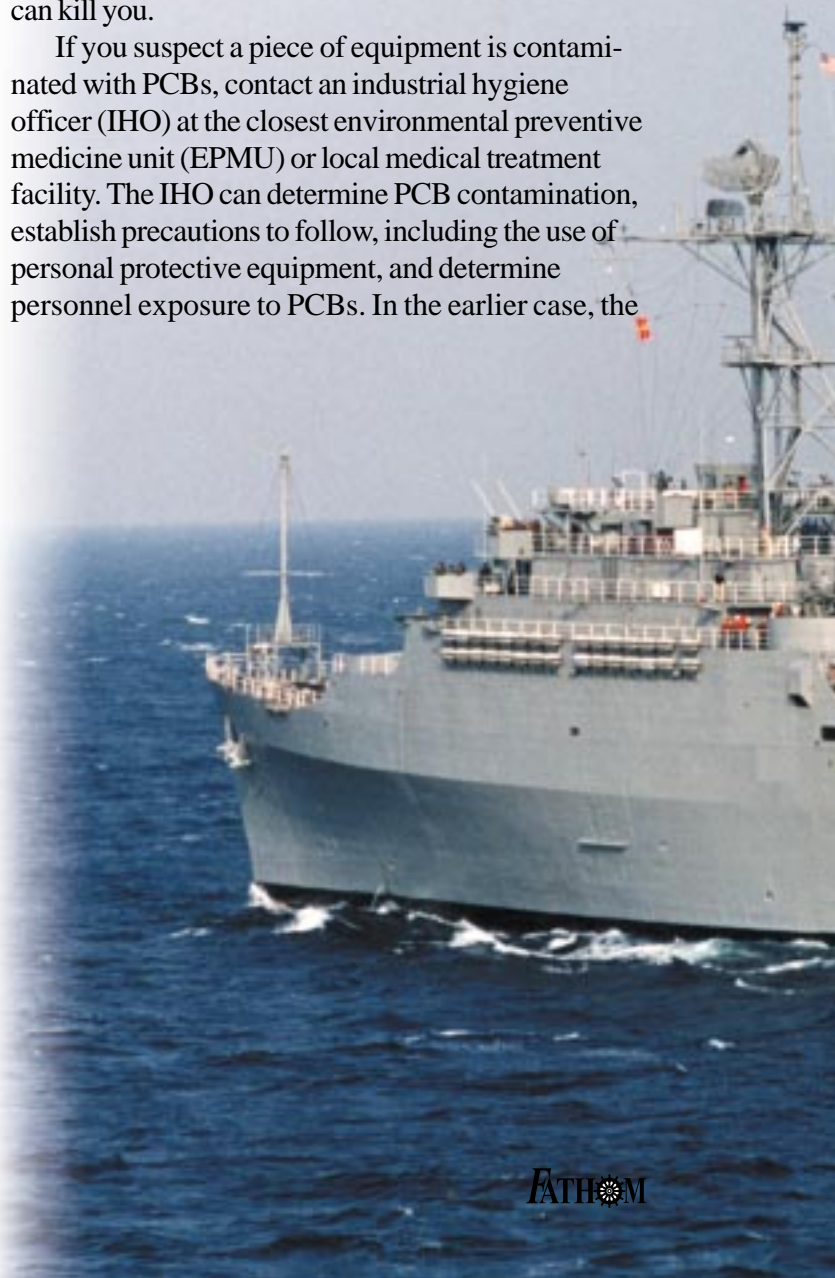
I arrived aboard the ship the next day to check the mysterious substance. Its physical characteristics pointed to one thing: PCBs. Using glass-fiber filters dipped in hexane, I took a couple of wipe samples from an area measuring about 100 square centimeters. Laboratory tests confirmed our suspicion. The PCB concentrations were 2.84 and 5.94 micrograms. A red flag immediately went up.

PCBs are toxic chemicals belonging to the chlorinated-hydrocarbon group of substances. Generic synonyms for PCBs include chlorinated biphenyls, chlorinated diphenyls, and chlorodiphenyls. They resist high heat, are chemically stable, non-corrosive to metals, have low flammability, low vapor pressure, and low conductivity. They have been used extensively as insulators and coolants in electrical equipment. To a lesser extent, they have been used in paints and lacquers, adhesives, varnishes, caulking compounds, plasticizers, hydraulic fluids, lubricants, waxes, and sealants.

You can get PCBs in your system by ingesting them, inhaling them, absorbing them through the skin, and by eye contact, but the most direct and hazardous route is inhalation. The effects from short-term contact with a significant concentration of PCB vapors or liquids include irritation of the eyes, nose

and throat; headaches; and chloracne (an acne-like skin disorder caused by exposure to chlorinated hydrocarbons). Continuous exposures can also cause severe skin irritation, respiratory irritation, and liver and digestive-tract damage. Systemic intoxication, which is caused by severe over-exposure, is characterized by nausea, vomiting, weight loss, jaundice, edema, and abdominal pain. This condition can kill you.

If you suspect a piece of equipment is contaminated with PCBs, contact an industrial hygiene officer (IHO) at the closest environmental preventive medicine unit (EPMU) or local medical treatment facility. The IHO can determine PCB contamination, establish precautions to follow, including the use of personal protective equipment, and determine personnel exposure to PCBs. In the earlier case, the



low concentration of PCBs in the samples, the inherent low vapor pressure, and the one-time, short duration involved prevented exposure beyond the permissible limit.

My primary concern in that incident was to determine if anyone who had skin contact with the material had any skin lesions at the time. We tracked down everyone who had touched the material, interviewed them, and checked closely for any skin lesions on their hands or signs of chloracne. We documented our findings and briefed the people involved on the health hazards of PCBs, as well as symptoms to watch for that would indicate exposure. Liver-profile testing wasn't necessary.

Using PPE, the ship's crew cleaned up all affected equipment according to PMS card requirements. We advised them to post a 1-inch-by-2-inch PCB label on all the affected equipment as outlined in the NavSea requirement¹. We also held training for the crew in PCB-hazard awareness. ☺

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For More Info...

¹ NavSea S9593-A1-MAN-010, Shipboard Management Guide to PCBs, requires posting a 1-inch-by-2-inch PCB label on all exposed equipment. For additional information concerning PCB related work activities, refer to paragraphs C2307g and D1506e in OPNAVINST 5100.19D and appendices C23-E and D15-F.



The author found PCB leaks in this remote microphone-control station on an LPD's bridge.



Navy photo by Cdr. Alan J. Dooley